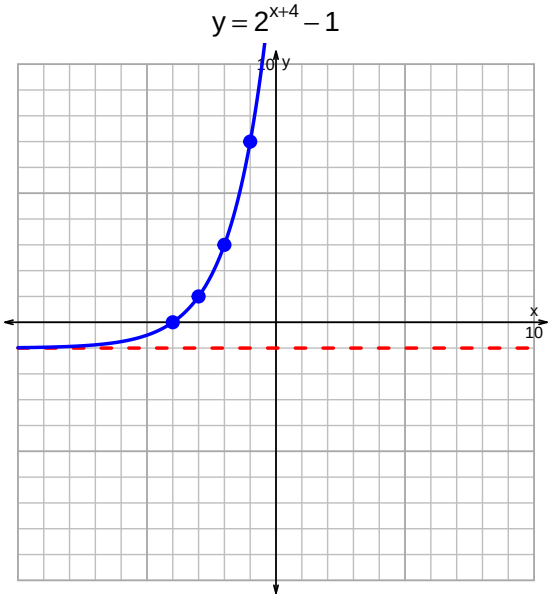
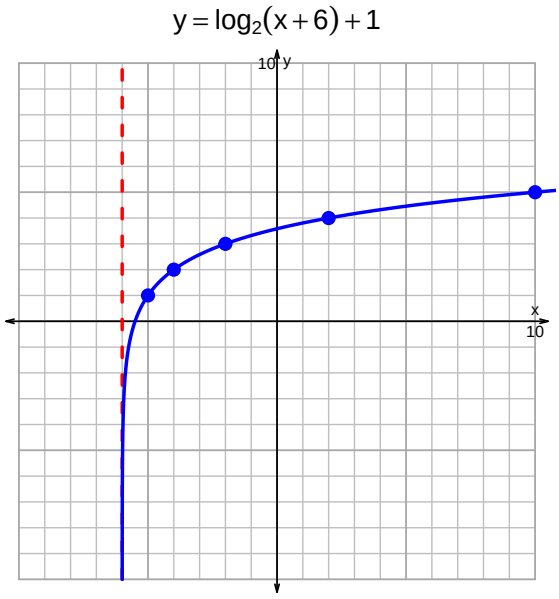
Name: Date:

s18: EXP LOG (SLTN v313)

1. (10 pts) Graph $y = 2^{x+4} - 1$ and $y = \log_2(x+6) + 1$ on the grids below. Also, draw any asymptotes with dashed lines.





Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-13 = \left(\frac{-3}{5}\right) \cdot 10^{-4t/7}$$

Divide both sides by $\frac{-3}{5}$.

$$\frac{13 \cdot 5}{3} = 10^{-4t/7}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{13 \cdot 5}{3}\right) = \frac{-4t}{7}$$

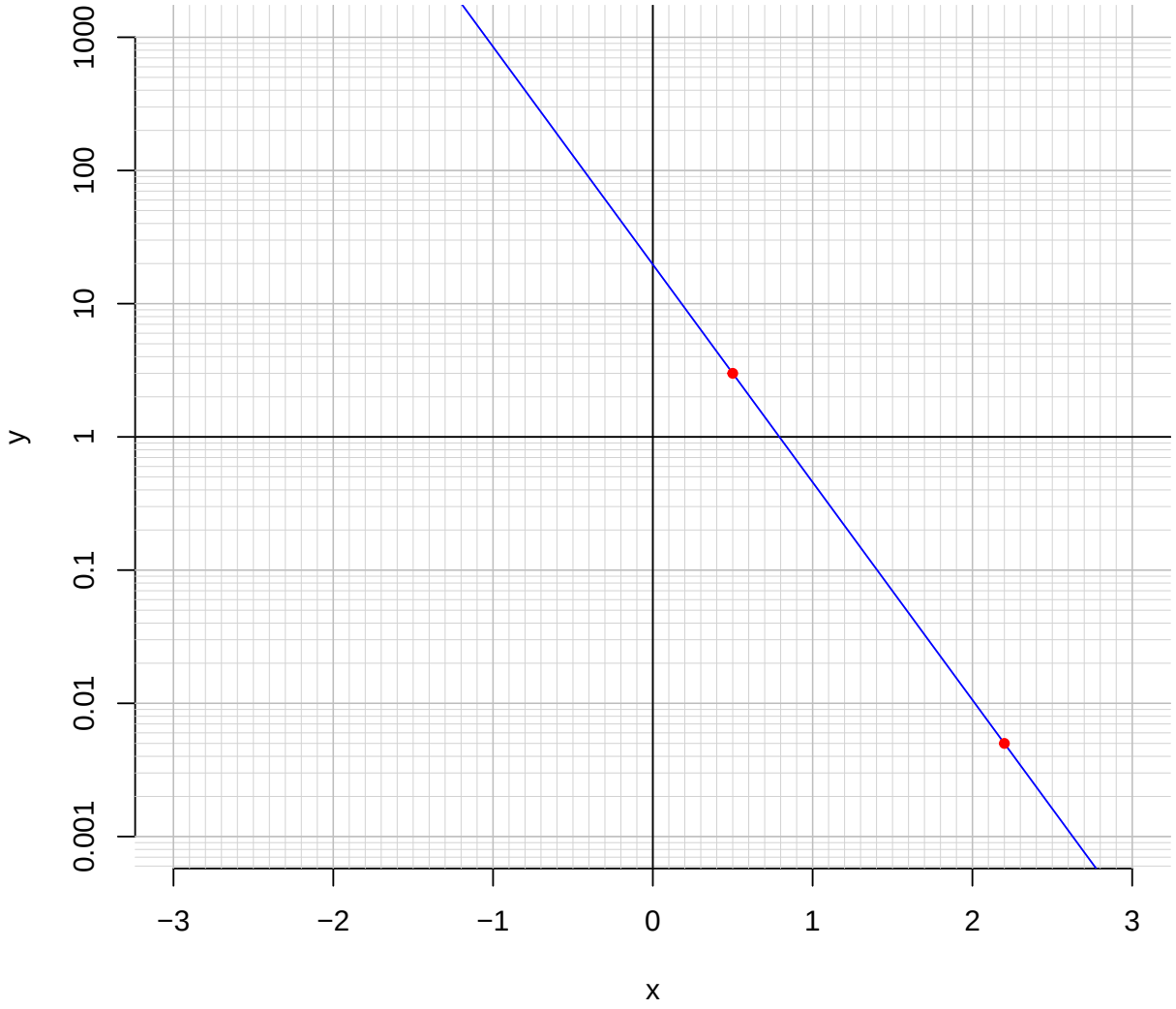
Divide both sides by $\frac{-4}{7}$.

$$\frac{-7}{4} \cdot \log_{10}\left(\frac{13 \cdot 5}{3}\right) = t$$

Switch sides.

$$t = \frac{-7}{4} \cdot \log_{10}\left(\frac{13 \cdot 5}{3}\right)$$

3. (10 pts) An exponential function $f(x) = 19.7 \cdot e^{-3.76x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(2.2)$.

$$f(2.2) = 0.005$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{3.76} \cdot \ln\left(\frac{x}{19.7}\right)$$

Using the plot above, evaluate $f^{-1}(3)$.

$$f^{-1}(3) = 0.5$$